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February 9, 1999 98-478-01

Mr. Jonathan Adenuga
USEPA - Region V
77 West Jackson Boulevard
Chicago, IL 60604-3590

RE: Refined Metals Corporation
Analytical Parameters - RFI
EPA ID No. IND000718130

Dear Mr. Adenuga:

This letter responds to QAPP Comment No. 5 of the EPA's December 18, 1998 comments to the RFI work plan (the Comment Letter). In Comment No. 5, the EPA indicated that additional justification regarding analytical parameter selection was warranted. To obtain information justifying analytical parameters, file searches were conducted at the RMC Beech Grove Facility and the Indiana Department of Environmental Management (IDEM). Additionally, current and former employees were interviewed. Information justifying analytical parameters is provided below.

Although not indicated in the Comment Letter, the EPA has expressed concern that operations prior to secondary lead smelting operations may have resulted in impacts to the facility. Several sources document that prior to construction of the smelter, the property was undeveloped farm land. Therefore, operations prior to the site being used as a lead-smelting facility should not be a concern.

The RMC Beech Grove facility was the location of secondary lead smelting operations since 1968. The initial secondary lead smelting operations involved the processing of lead-bearing wastes generated at off-site locations. The wastes were primarily the components from used lead acid batteries generated at off-site battery breaker operations and transported to the RMC location for processing. In 1984, RMC installed an on-site battery breaker and began receiving and breaking used lead acid batteries at the facility.

The smelting process involved heating the lead-bearing wastes to temperatures that would melt the lead and allow its separation from non-lead materials. The process was performed through the facility furnace which was fueled by natural gas and coke. Antimony, tin, sodium hydroxide, red phosphorus and iron were introduced into the molten lead to refine the quality of the lead and remove impurities, such as sulfur.

Most of the waste material generated at the facility was recycled through the blast furnace to recover lead. Pallets and general refuse were sent to sanitary landfills. Waste slag was shipped to sanitary, then hazardous, landfills. Plastic parts from the battery crusher were put into a trailer and sold to a plastics company for recycling. One parts cleaning unit was used in the machine shop. The waste solvents were recycled by outside vendors retained to maintain the unit.

Metals use at the site is well documented. As part of this evaluation, reviews of various sources of information were conducted to determine the extent and nature of VOC usage at the site. These are discussed further below.

Employee Interviews

Both current and former employees have been contacted regarding historic use of VOCs at the facility. Employees interviewed were employed during the 1977 to 1998 time period. All employees interviewed indicated that VOC usage was limited to a parts cleaning unit in the maintenance area. This unit was reportedly always serviced by an outside vendor. Most recently, the unit was serviced by Safety Kleen. Employees indicated that materials containing VOCs were never accepted at the facility for processing. Employees indicated that VOCs were not used in the smelting process. Employees also indicated that other than the spent VOCs generated in the cleaning unit, no wastes containing VOCs were generated.

Hazardous Waste Manifests

Copies of hazardous waste manifests at the facility are limited to those from the 1993 to 1996 time period. With the exception of two manifests documenting shipments of waste solvents to Safety Kleen, all manifests reviewed at the facility document shipments of lead-bearing materials to the facility or lead-bearing wastes from the facility.

Because it was uncertain if the facility's file of hazardous wastes manifests is complete, IDEM's manifest records were reviewed. IDEM has manifest records dating back to late 1986. IDEM's manifest records from 1986 to 1991 are recorded on a computer tape used by a system which is no longer operable. Consequently, this manifest information is not available. Manifest records from 1991 to the present are contained both on a readily accessible computer data base and on microfilm. However, due to time limitations, only IDEM's computer data base for 1991 to the present were reviewed for this evaluation.

IDEM's computer database indicates 318 loads of wastes shipped under a hazardous waste manifest were received at the facility from June 18, 1991 to March 14, 1995. All but four of these shipments listed a waste code of D008 (characteristically hazardous for lead). Two shipments listed a waste code of D002 (acidic). The data base does not list a waste code for the remaining two shipments. No shipments listed a waste code indicating receipt of waste containing VOCs.

IDEM's computer database indicates 1,195 loads of wastes under a hazardous wastes manifest were shipped from the facility from November 11, 1991 to January 20, 1997. All but 131 of these shipments listed a waste code of D008 or K069 (baghouse dust from secondary lead smelting operations). Of the remaining 131 shipments, 119 did not indicate a waste code. All shipments which did not list a waste code were sent to Refined's secondary lead smelter in Memphis, Tennessee indicating these shipments were likely lead-bearing materials. Eleven shipments indicated a waste code of D001 all of which were shipments to Safety Kleen One shipment indicated a one-time shipment with a waste code of F003. The nature of this shipment is uncertain. These manifest records are consistent with employee reports that VOC usage was limited to the maintenance area.

Hazardous Waste Reports

Hazardous waste reports submitted during the 1985 to 1996 time period were reviewed. No VOC wastes are indicated on the reports.

Form R Reports (EPCRA/SARA Title III, Section 313)

Form R reports submitted during the 1987 to 1997 time period were reviewed. No releases of VOCs over threshold planning quantities were reported.

Tier II Reports (EPCRA/SARA Title III, Section 312)

Tier II reports submitted during the 1987 to 1997 time period were reviewed. No VOCs over threshold planning quantities were reported.

RCRA Inspection Reports

Documentation of twenty RCRA inspections by IDEM or the Indiana State Board of Health (IDEM's predecessor) over the 1981 to 1995 time period were reviewed. Most of these inspection reports do not mention VOCs, supporting employee reports of limited use. Six inspection reports do indicate Safety Kleen serviced the parts cleaning unit.

RCRA Part A Applications

Draft and final RCRA Part A applications generated from 1984 to 1990 were reviewed. VOCs are not indicated on these applications indicating such materials were not received at the facility for processing.

Environmental Risk Assessments

A draft environmental risk assessment report prepared by Environmental Strategies Corporation in 1996 was reviewed. This report indicates that the parts cleaning unit was being serviced by Safety Kleen. The report also indicated that shipments of waste solvent back to Safety Kleen were not being manifested at the time that the report was prepared.

Other Sources

In addition to the sources discussed above, documents including Notices of Violations, Consent Decrees, Agreed Orders, Operating Permits, Discharge Permits, and draft contingency plans were reviewed to determine VOC usage at the facility. Other than use of VOCs in the maintenance area, none of these documents indicated receipt of VOCs, use of VOCs in the smelting process, and/or generation of VOC-containing wastes.

PROPOSED ANALYTICAL PARAMETERS

Soil Parameters

The RFI work plan proposed to analyze soil samples for total lead and cadmium. The justification for limiting soil analysis to lead and cadmium is based on knowledge of the property history, knowledge of the operational history of the facility (generator knowledge), and Exide's experience at numerous other secondary lead smelters. It has been Exide's experience that lead and cadmium drive any risk assessment and /or remediation which may be necessary. Typically, if lead and cadmium are brought below the selected clean-up criteria, any other metals which may remain are well below levels of concern.

Although the EPA did not request additional analytical parameters in the Comment Letter, the EPA indicated during later conversations that analysis for all RCRA metals would be appropriate. We acknowledge that one or more of the additional RCRA metals requested by the EPA can be found at low concentrations in materials typically received at secondary lead smelters. Although we question the value of analyzing soil samples for these additional parameters, we cannot question the potential for their presence. Consequently, soil samples will be analyzed for all RCRA metals.

Documentation of the cleanup of a diesel spill in 1983 was not found. Samples will be collected from the former spill area and analyzed for diesel parameters (benzene, toluene, ethylbenzene, cumene, naphthalene, fluorene, and phenanthrene).

Groundwater Parameters

The RFI work plan proposed to analyze ground water samples for total and dissolved lead, arsenic, antimony, and cadmium. As with the parameters for soil analysis, the justification for limiting groundwater analysis to these parameters is based on knowledge of the property history, knowledge of the operational history of the facility (generator knowledge), and our experience at numerous other secondary lead smelters. In addition, limiting analysis to these parameters is supported by historic groundwater data. Although the EPA did not request additional analytical parameters in the Comment Letter, the EPA indicated in later conversations that analysis for Appendix IX parameters may be appropriate.

Regarding metals analysis, historic data supports limiting analysis to a few metals. Previous investigations have been focused on the analyses of inorganic parameters. Groundwater samples have been analyzed for total and dissolved antimony, arsenic, cadmium, and lead, and sulfate, pH, conductivity, and turbidity. Samples were analyzed on a fairly consistent quarterly basis (about 20 times) from June 1991 through March 1997. Lead was detected above the MCL (15 ug/l) in unfiltered groundwater on three separate occasions. Lead was detected above the MCL in filtered groundwater only once, and is believed to be a discrepancy (such as mis-labeled bottles or mis-reported results) because the corresponding unfiltered sample was below the MCL. Arsenic was detected in unfiltered groundwater above the MCL (50 ug/l) on two occasions; arsenic was not detected above the MCL in filtered groundwater. Therefore, for the most part the results of the groundwater sampling were below MCLs. Where exceedences occur, it appears to be due to suspended sediment in the samples rather than a sample representative of dissolved contaminants.

Regarding analysis for volatile organic compounds (VOCs), it is our experience that secondary lead smelters do not accept VOCs for processing, do not use VOCs as part of the smelting process, do not generate VOC-containing waste, and only use small quantities of VOCs for parts cleaning activities associated with maintenance. However, because Exide only recently acquired the facility, we must rely on available records and interviews with current and former employees to determine if VOCs are of concern. Based on these sources, analysis of groundwater for VOCs is not warranted.

SUMMARY

Exide believes the information above provides sufficient justification to limit analytical parameters for the RFI. Samples collected from the site will be analyzed for the eight RCRA metals as agreed with the USEPA. Samples collected from the former diesel spill area will be analyzed for benzene, toluene, ethylbenzene, cumene, naphthalene, fluorene, and phenanthrene. Given the extremely short time frame to assemble the above information, it is possible that other sources providing additional justification for limiting the proposed parameter list may be available. However, because it appears that VOCs were not widely present at the facility, such documentation would likely be similar to that above. Therefore, we believe that analysis of samples for VOCs other than those indicated for diesel is not warranted.

Although significant revisions to the QAPP have already been made in response to the Comment Letter, significant additional revisions could be necessary depending on the final analytical parameters. We, therefore, request your concurrence with the parameters proposed so the RFI Work Plan may be finalized for your review.

Sincerely,

ADVANCED GEOSERVICES CORP.

Edie M. Gair, P.G.
Senior Project Geologist

Paul G. Stratman, P.E.
Project Consultant

EMG:PGS:lld

Schupp: A802-06
File: III.C.8.b.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

REPLY TO THE ATTENTION OF:

5SMQA

MEMORANDUM

DATE: January 30, 1989

SUBJECT: Site Sampling Plan for Refined Metals, Inc. Facility in Beech Grove, Indiana

FROM: James H. Adams, Jr., Chief
Quality Assurance Section

TO: William Muno, Chief
RCRA Enforcement Branch

We have reviewed the sampling plan for the Refined Metals, Inc. RCRA facility, which we received on January 27, 1989. We require a Quality Assurance Project Plan (QAPjP) for all sampling and analysis efforts. This document covers only one of the 16 QAPjP elements that must be addressed for these projects. We may provide approval of the sampling plan as one of the QAPP elements, however it is deficient in several areas. The following comments are provided to identify those deficiencies and recommend corrective measures.

I. Section 4.0, Sampling Methodology, refers to compositing soil samples. According to the description of soil sampling, the term "Mixing" would be more appropriate.

II. A complete, specific sample numbering system should be described. The system should provide unique sample numbers and consider field duplicates and blanks. Since the samples are proposed to be sent through the CLP, a Region 5 CRL sample number will also have to be assigned to each sample. Please correct section 5.1 to show these changes.

III. Equipment decontamination should add a final air drying step to the procedure listed in section 5.2.

IV. Analytical requirements in section 5.3 are too vague. Please specify what is meant by "total RCRA metals". Please provide specific analytical method references and identification of the project's target analytical parameters. Since these samples will be sent through the CLP, Special Analytical Service (SAS) request forms will have to be completed and submitted for review because the analyses are not from one of the Routine Analytical Service (RAS) Statement of Works (SOWs).

V. Table 2 does not mention preservative (4 degrees C) nor holding time requirements. Metals holding times by region 5 policy are the same for soils as they are for water samples, i.e. 6 months for metals, 28 days for mercury as per 40 CFR Part 136. Equipment rinsates will have to be treated as water samples and appropriately preserved with nitric acid to a pH<2, and kept at 4 degrees C until analysis.

If the TES IV Generic Quality Assurance Project Plan is to be used as a substitute for this project, as is indicated by this document's references to it, we will require more site specific information for each of the 16 QAPjP elements. We will also require a copy of the TES IV QAPP to check the appropriateness of the sampling plan references. Without specific data usage statements, data quality objectives and quality assurance objectives for the project, it is impossible to evaluate the selected metals methods. These items are integral parts of a QAPjP.

If there are any questions or comments concerning this memo, please contact George Schupp, Chemist, at 886-6221.

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RCRA FACILITY ASSESSMENT QUALITY ASSURANCE PROJECT PLAN

Solid Waste Branch, Region V

February 10, 1987

RCRA FACILITY ASSESSMENT QUALITY ASSURANCE PROJECT PLAN

Solid Waste Branch, Region V

February 10, 1987

RCRA FACILITY ASSESSMENT QUALITY ASSURANCE PLAN

APPROVAL: DATE:

Karl E. Bremer — 2/11/87

Karl E. Bremer
Solid Waste Branch
Chief, Technical Programs Section

James H. Adams Jr. — 3/13/87

James Adams
Environmental Services Division
Chief, Quality Assurance Office

Charles J. Kelly for CR — 2/24/87

Curtis Ross
Environmental Services Division
Director, Central Regional Laboratory

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3. PROJECT DESCRIPTION

Sections 206 and 233 of the Hazardous and Solid Waste Amendments of 1984, require corrective action for release of hazardous waste or constituents from any solid waste management unit at facility permitted after November 8, 1984, or at a facility with interim status. Hazardous waste is defined in 40 CFR Part 261 Subparts C and D and hazardous constituents are defined in 40 CFR Part 261 Appendix VIII.

The purpose of a RCRA Facility Assessment (RFA) is to determine if such a release has occurred. The RFA is not intended to determine the full extent of the release, nor to fully characterize it. It is understood that if contamination is found to be present, then a further and more extensive investigation, termed a RCRA Facility Investigation (RFI) will be conducted.

An RFA consists of 3 components, namely, 1) the preliminary review (PR), 2) the visual site inspection (VSI), and, when necessary 3) sampling. Sampling and analysis is not automatically included in an RFA in every case. The need for sampling will be decided by the likelihood of a release as determined by the PR and VSI.

In cases where no evidence of a release can be found either through a review of files or through a visual site inspection, the sampling may be waived. In cases where contamination has already been documented and is not refuted by the owner/operator, sampling would not be necessary within the RFA. In these cases where a release has already been established, an RFI would be carried out to fully characterize the contamination.

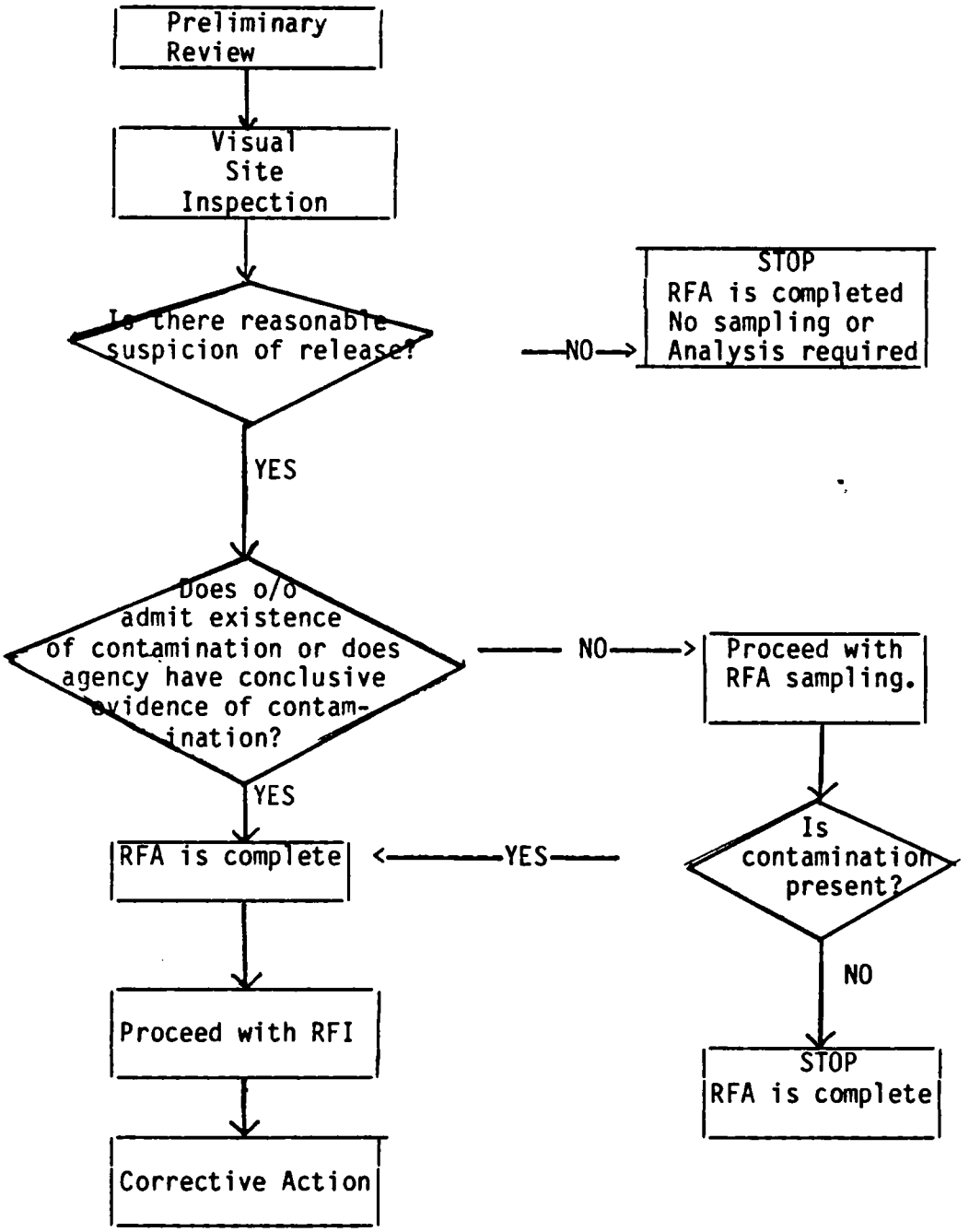
Sampling and analysis under the RFA program, then, is intended only at those facilities where there is reasonable suspicion that a release has occurred, but neither conclusive proof nor concurrence of the owner/operator exists.

The sampling for the RFA, therefore, should establish evidence of a release, but need not fully characterize it. The full extent of the release, as well as the contaminants and concentrations involved, will be determined during the RFI.

The location of sampling sites, the number of samples, the type of samples and the contaminants of concern will be determined on a site specific basis and presented in a site specific sampling plan for each facility.

Sampling and analysis under the RFA program, then, is intended only at those facilities where there is reasonable suspicion that a release has occurred, but neither conclusive proof, nor the concurrence of the owner/operator exists.

This Quality Assurance Project Plan is designed to define the needs of the RCRA Facility Assessment (RFA) sampling program and the planning process that will be used to generate site specific sampling plans.



4. PROJECT ORGANIZATION AND RESPONSIBILITY

The RCRA Facility Assessment (RFA) procedure may require field sampling and laboratory analysis. The U.S.EPA has executed the RCRA Implementation Contract and the Technical Enforcement Support (TES IV) contracts to assist in the implementation of RCRA, including RCRA Facility Assessments. The two contracts and their project organizations are discussed below. An organizational chart detailing the responsibility within Region V regarding contract management is given in Figures A1 and A2 in appendix A. Because these are national contracts, the Contract Officer and Project Officer are both from Headquarters staff. Duties and responsibilities are summarized below. However, direct oversight of the contractor and management of both contracts is the responsibility of the Regional Project Officer (RPO).

4.1 RCRA Implementation Contract

The U.S.EPA has executed the RCRA Implementation Contract to support the permitting program under RCRA. Under this contract, a work assignment has been executed to procure the services of A.T. Kearney to perform preliminary reviews and visual site inspections, and to provide the field sampling and laboratory analysis associated with the RCRA Facility Assessments.

4.1.1 Prime Contractor Responsibilities

Staff from A.T.Kearney have been assigned the following key management responsibilities:

1.- Technical Director: Overall Responsibility
2.- Project Manager: Work Assignment
3.- Field Sampling Teams with a Team Leader: Sampling Operations

4.1.2 Technical Enforcement Support IV

The U.S.EPA has executed the Technical Enforcement Support contract to assist the Regions in implementing corrective action activities. Under this contract, a work assignment has been executed to procure the services of Jacobs Engineering Group, Inc., to provide field sampling services.

4.2 Headquarters Responsibility

4.2.1 Contract Officer

The Contract Officer is located in the USEPA Headquarters Procurement Operations in Washington D.C.. The responsibilities of the Contract Officer include:

1. signing the contract,
2. obligating funds,
3. issuing work assignments,
4. modifying contract terms or conditions,
5. terminating a project.

4.2.2 Project Officer

In certain instances, the issuance of work assignments can be delegated to the Project Officer. The role of the Project Officer includes:

1. monitoring the contract performance from a financial and technical standpoint,
2. providing technical direction to the contractor, certifying monthly vouchers for payment, and if necessary, recommends contract modifications,
3. assisting in the contract close out procedure.

4.2.3 Region V Participation

An organizational chart detailing the responsibility within Region V of the USEPA, regarding management of contractor assistance is given in appendix A. Within Region V, a Regional Project Officer has been assigned from within the States Program Unit of the Solid Waste Branch of the Waste Management Division. Work assignments are developed at this level and forwarded to the Project Officer in Headquarters for approval. Extensive contract tracking, including review and evaluation of work assignments is also carried out by the Regional Project Officer.

For each facility, a Region V task manager, hereafter referred to as the Facility Permit Writer, is responsible for the planning and management of the sampling event. The sampling team leader will work with the Facility Permit Writer in developing the site specific sampling plan.

Laboratory analysis will be done through the Contract Laboratory Program (CLP) with charge back to the RCRA program. Technical support for the analytical services will be provided by the Region V Central Regional Laboratory (CRL) in the Environmental Services Division, Scheduling of samples for analysis will be through the CRL's RCRA Coordinator who will arrange for services through the region's Regional Sample Control Coordinator. The Regional Sample Control Coordinator will arrange for the scheduling of samples with the national Sample Management Office (SMO). All direct scheduling of analytical services with the CLP laboratories will be by the SMO.

5. Quality Assurance Objectives

The overall objective for the RCRA Facility Assessment (RFA) quality assurance is to develop and implement procedures for field sampling, chain of custody, laboratory analysis and reporting that will adequately determine if further investigation including additional sampling will be necessary.

The precision and bias of the data collection activity as a whole will be addressed in the specific sampling plans and in the analytical protocols. The precision and bias of the laboratory portion of the data collection process have been addressed in the CLP SOWs and are adequate to assure that any differences between field samples and background samples can be established objectively. The quality assurance objective is only to determine the presence or absence of a contaminant above background levels within the limits of currently available, routine analytical systems.

The use of appropriate sampling techniques and equipment and proper decontamination procedures should eliminate contamination from external sources. The investigative field quality control procedures that will be used will be identified on a site specific basis in the site sampling plans. The site specific sampling plan will address representative sampling procedures for each location, including the number and types of samples including field control samples.

For the laboratory services, the quality control procedures as specified in the Contract Laboratory Program (CLP) Statements of Work (SOW) for routine analytical services (RAS) are adequate for this program. For samples requiring special analytical services (SAS), specific quality control procedures will be designed into the SASs. (Commonly used quality control terms are defined in Appendix B.)

6. SAMPLING PROCEDURES

General procedures to be used for obtaining samples of soils sediments and water, during field operations are found in "RCRA Facility Investigation Guidance" Volumes II and III, Draft, October 1986. Other sampling procedures may be used if they are stated in the site specific plan. Procedures for the preservation of samples will be according to the CLP SOW.

Before sampling of any site is performed, the leader of the field sampling team will meet with the Facility Permit Writer to establish the purpose of sampling, the sampling methodologies to be employed, field controls and the specific analyses to be conducted on the samples. For each site, the Facility Permit Writer and sampling team will prepare a site specific sampling plan. The site specific sampling plan will address which sampling methods are to be used, sampling locations, the number and type of samples and required field controls. The Facility Permit Writer and the field sampling team will determine whether

or not the CLP RAS is appropriate for the sample analysis. If CLP SAS is required or if the Facility Permit Writer is uncertain about the appropriateness of the CLP RAS, the Facility Permit Writer will contact the CRL-RCRA Coordinator for technical support. After the planning meeting, the field sampling leader will acquire necessary sampling supplies. Appendix C lists the appropriate sample size, bottle type and preservatives for each of the routine analytical services.

Contractor will prepare protocols for routine sampling practices. The protocols will be referenced in the sampling plans and copies of the protocols will be filed with this QAPP as they are developed.

7. SAMPLE CUSTODY

Custody procedures have been established using the following guidance. A sample is under custody if:

1. It is in your actual possession, or
2. It is in your view, after being in your physical possession, or
3. It was in your possession and then you locked or sealed it to prevent tampering or
4. It is in a secure area.

7.1 Field Sampling Operations.

Field samplers will initiate custody procedures with the collection of samples. This will facilitate sample tracking, sample shipment and transfer of custody.

Upon collection of each sample, a sample label will be attached to the container. Among the information shown on the label, there will be a unique field sample number assigned by the sampling team. The sampling leader will also complete a field log sheet indicating each sample collected.

The log sheet will include the unique field sample number as shown on the sample label. The log sheets will be reviewed by the Facility Permit Writer to ensure that the sheets have been completed correctly. If any corrections would be necessary, a memorandum will be written to explain the changes and will be signed by the sampling leader and the Facility Permit Writer When a review of the log sheets is completed, they will be placed into their appropriate files. Examples of sample labels and sample log sheets are shown in Appendix D.

7.2 Sample Shipment

Upon completion of sample labels and field log sheets, samples will be placed in appropriate storage/shipment containers. The containers will remain in the possession of the field sampling team until the samples are shipped to the laboratory for analysis.

To assure custody of samples during transport and shipping, each sample within a packing container is recorded on a chain-of-custody record. Each sample number is recorded and the number of containers shipped is recorded on the sheets. Other information regarding the project, samples (or shipper if returning empty containers), and method of shipment is also recorded. The sheet will be signed and dated. The original custody sheet is then placed inside a protective package and shipped inside the shipping container with the samples.

To ensure that samples have not been handled or tampered with during shipment, shipment containers will be sealed by the sampling team. The seal will be placed so that the container cannot be opened without breaking the seal. The seal tag number is specified on the chain-of-custody form.(Shown in appendix D)

7.3 Receipt of Samples

The laboratory will have a designated sample custodian responsible for receipt of samples. The custody of the samples will be maintained as outlined in the CLP SOWs.

8. Calibration

No field monitoring or evaluation equipment will be used. Laboratory instruments will be tuned, aligned and calibrated according to the procedures in the CLP SOW.

9. Analytical Procedures

Unless the site specific planning process indicates otherwise, the analytical methods to be used are those contained in the CLP procedures for routine analytical services. Examples of the current CLP "SOW for Inorganic Analysis Multimedia, Multiconcentration" and CLP "SOW for Organic Analysis Multimedia, Multiconcentration" are attached as Appendixes E and F respectively. The CLP SOWs are subject to revision and the SOW that is current at the time of analysis will be used. The capabilities of the analytical systems are not expected to change significantly during the life of this

10. Data Validation and Reporting

Data packages from the laboratory will be delivered to the Region V Central Regional Laboratory (CRL) and the SMO as outlined in the CLP contracts. The CRL will review the data to verify that the objectives for quality assurance as set forth in Section 5 have been met. Specific criteria for data review have been established by the CRL to meet the needs of the RFA program. The data review process will include contract compliance screening (CCS) by the SMO as outlined in "Contract Compliance Screening Procedures For RAS Organics" and "Contract Compliance Screening Procedures For RAS Inorganics". The CRL will review the data using a modification of the CLP "Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses" and "Laboratory Data Validation Functional Guidelines for Evaluating Inorganic

Analyses". The review by the CRL should conclude that laboratory and analytical system performance was adequate to determine, with acceptable confidence, that contamination above background levels is either present or absent. If the data does not conclusively determine the presence or absence of a release within these confidence intervals, then the study is inconclusive and corrective action must be taken according to Section 15.

After the data has been reviewed, the CRL will prepare a report for the Facility Permit Writer.

A report will be prepared by the sampling team which will include all information collected during sampling procedures as well as documentation on how and where samples were collected.

The field report will be combined with the CRL report in a final report. The responsibility for the final report on the sampling effort will belong to the contractor responsible for the RFA sampling. The report is to be delivered to the Regional Project Officer.

11. Internal Ouality Control

To assure the quality of field operations, a Region V Facility Permit Writer will review, in detail, the sampling plan prepared by the contractor. The Facility Permit Writer is responsible for assuring that the sampling plan contains all of the necessary information, including number and types of samples, sampling locations, sampling techniques, and, number and type of field control samples.

Before commencing field operations, the Facility Permit Writer will discuss the procedures to be followed in the site specific sampling plan and this QAPP with the sampling team.

As an internal check that proper field procedures are being followed, the Facility Permit Writer may accompany the sampling team to the site. The Facility Permit Writer will audit the performance of the sampling team.

The laboratory internal quality control will be in accordance with the protocols in the CLP SOWs. Appendix B contains definitions for the basic elements of quality control.

The number and frequency of laboratory controls is specified in the CLP SOWs. The number and type of field controls will be specified in the site specific sampling plans.

12. Performance and System Audits

Laboratory audits will be performed by the CLP program according to the CLP SOW.

No field testing will be performed. Procedures for collecting, preserving and transporting samples in the field will be reviewed during periodic field audits by the Facility Permit Writer as described in section 11 of this QAPP. Audit reports will be filed in the site file. Performance audit samples from the field will not be routinely submitted. If the submission of performance audits from the field is chosen as part of the site specific planning process, the number and type of performance audit samples to be submitted will be planned in conjunction with the CRL RCRA Coordinator and documented in the sampling plan.

System audits of RFAs to ensure that trends in the quality control systems are being evaluated. The systems audits will be conducted by the Facility Permit Writer.

13. Preventative Maintenance

The preventative maintenance required for laboratory instruments is described in the CLP SOW. No field instruments will be used. Equipment used in the field for collection of samples will be maintained clean and free of contamination according to the sampling protocols. Unanticipated field maintenance will be documented in the field report and filed in the specific site file by the RCRA Program Coordinator.

14. SPECIFIC ROUTINE PROCEDURES USED TO ACCESS DATA PRECISION, ACCURACY AND COMPLETENESS

14.1 Laboratory Data Assessment Procedures

The CRL will review data using an optimized form of the CLP "Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses" and "Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses". The CLP guidance has been modified such that the data review will terminate the if presence of contamination is confirmed and can be objectively substantiated. The review by the CRL should conclude that laboratory and analytical system performance was adequate to determine, with acceptable confidence, that contamination above background levels is either present or absent. If the data does not conclusively determine the presence or absence of a release within these confidence intervals, then the study is inconclusive and corrective action must be taken according to Section 15.

14.2 Precision

Precision will be assessed with the use of co-located field samples and laboratory replicates. The laboratory precision will not be investigated. The precision of the laboratory systems will be inferred from the limits on the laboratory control samples. The number of replicates and the samples to be replicated will be specified in the site specific sampling plan and in the request to the laboratory for analysis.

14.3 Biases

Biases will be assessed by the use of blanks, surrogates and spikes as specified in the CLP SOW. The site specific sampling plan and the request to the laboratory for analysis will specify which environmental samples are to be spiked.

For water samples, both field and laboratory blanks will be used. For soil samples, only laboratory blanks will be used. A field blank will not be taken for soil sampling. Background samples will be obtained instead. Because the variation among background samples is expected to be far greater than the variations introduced by the equipment, an additional background sample is considered more useful than a field blank for soil sampling. Gross contamination introduced by the equipment would be evident in a background sample obtained after the environmental samples. The site specific sampling plan will identify the background soil samples.

14.4 Completeness

Although the study is designed to only take necessary samples, some redundancy will be included to cover the possible loss of critical samples. The site specific sampling plan will be designed such that if some samples are lost, the study may still be valid. If the loss of any sample occurs, the study will be reviewed for completeness by the Facility Permit Writer.

14.5 Overall Data Assessment

An assessment of the adequacy of the data collected for each site including biases, precision and completeness will be filed with the final report by the Facility Permit Writer.

15. CORRECTIVE ACTION

Corrective action for deviations in the field procedures as specified in the site specific sampling plan will be the responsibility of the sampling team and the Facility Permit Writer. In the case of field error, the EPA Facility Permit Writer will meet with the sampling team to discuss corrective actions. Additional sampling will be required to correct for any samples that may have been omitted, lost, contaminated or improperly tracked.

Corrective action for errors originating in the laboratory are addressed in the CLP SOWs. Corrective actions will include, but not necessarily be limited to: recalibration of instruments using freshly prepared calibration standards, replacement of lots of solvent or other reagents that give unacceptable blank values, additional training of laboratory personnel in correct implementation of sample preparation and analysis methods, and reassignment of personnel, if necessary, to improve the overlap between operator skills and method requirements. After the corrective actions have been taken and satisfactory quality control sample results are obtained, samples will be re-run, if possible.

Corrective action for the entire RFA study will be necessary in the event that the final report fails to determine the presence or absence of a release. In this case, the Facility Permit Writer will meet with the sampling team to plan corrective action. Revisions will be made as necessary to achieve the objective of this program (see section 5) and additional sampling and analysis will be done as needed.

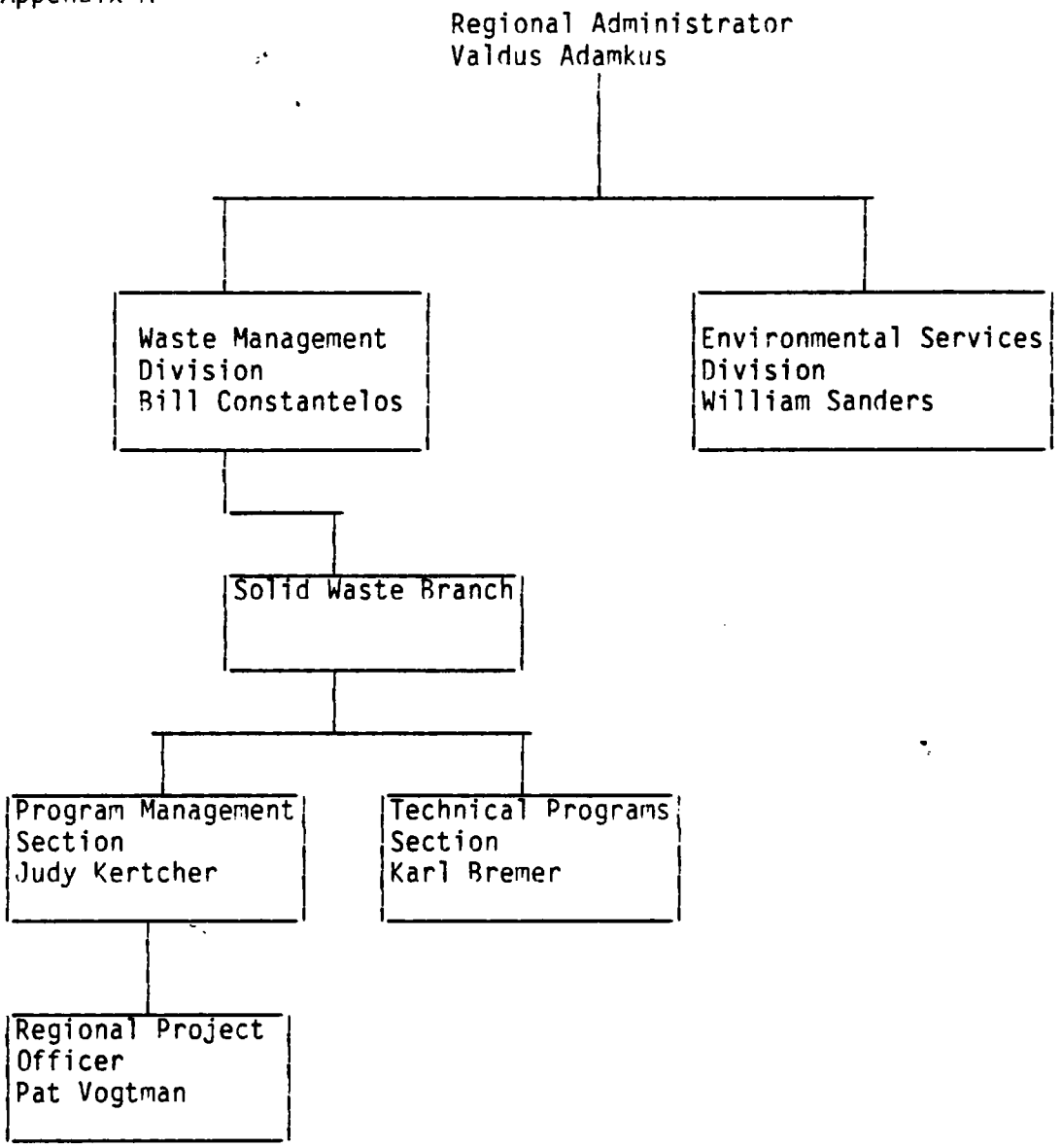
16. REPORTS TO MANAGEMENT

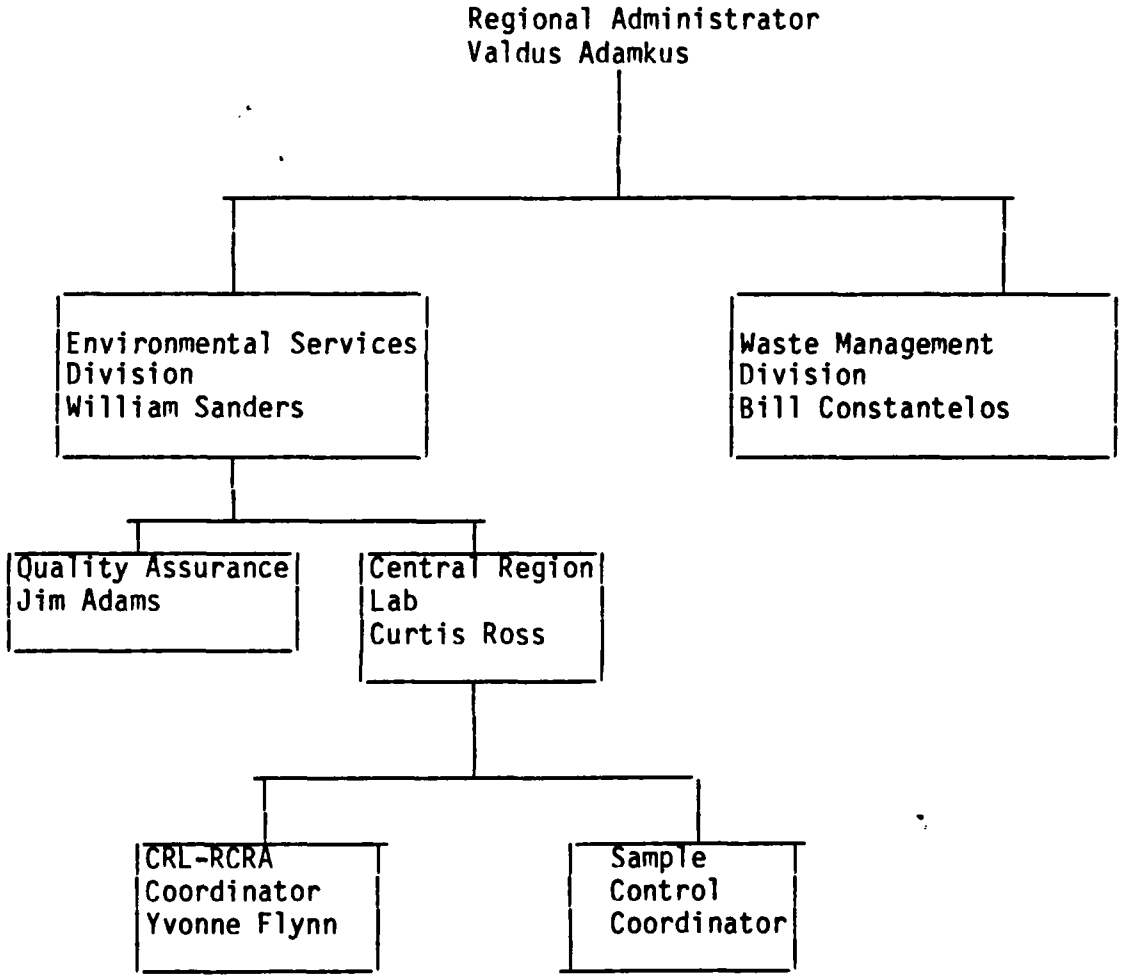
A report on field activities will be prepared by the sampling team leader and will be delivered to the Regional Project Officer. The report will then be delivered to the Facility Permit Writer who will review it for technical adequacy. The report from the CRL will be delivered to the Regional Project Officer and to the Facility Permit Writer. If the Facility Permit Writer is satisfied that the study has been properly documented and that the results are conclusive, then the Chief of the Technical Programs Section will be advised of the results of the study.

If the study in inconclusive, the Regional Project Officer will be so advised and corrective action will be taken according to Section 15.

APPENDIX A

Appendix A


Regional Administrator
Valdus Adamkus
Waste Management Division
Bill Constantelos
Environmental Services Division
William Sanders
Solid Waste Branch
Program Management Section
Judy Kertcher
Technical Programs Section
Karl Bremer
Regional Project Officer
Pat Vogtman


Regional Administrator
Valdus Adamkus
Environmental Services Division
William Sanders
Waste Management Division
Bill Constantelos
Quality Assurance
Jim Adams
Central Region Lab
Curtis Ross
CRL-RCRA Coordinator
Yvonne Flynn
Sample Control Coordinator

Roles and Responsibilities Applicable to Both Contracts

1. Contracts Program Manager (CPM)

The State Programs Unit (SPU) Chief, Jodi Traub, serves as the CPM. Her responsibilities include:

1) Setting priorities for management of the contracts
2) Preparing a Contract Use Plan (CUP)
3) Coordinates resolution of interorganizational issues
4) Supervising the RPO
5) Supervising the management of contractor performance
6) Serving as the Region's representative on the Performance Evaluation Board (PEB)

2. Regional Project Officer (RPO)

Pat Vogtman is the RPO for Region V for the A.T. Kearney Contract, and for the TES IV Contract serving the Solid Waste Branch. The RPO is the Region official with primary responsibility for contracts, and the overall management of the contractor program. The RPO works in conjunction with the TM's and the technical liason to carry out the following responsibilities:

a. Receiving and signing off on all WA and project requests for submission to the contractor.

b. Reviewing and approving the contractor's work plans, hours of labor and costs.

c. Distributing the contractor's deliverables progress reports, supervising the contractor's progress, financial reports, and specific outputs as defined in the WA.

d. Insuring a timely review of WA's, progress reports and outputs.

e. Coordinating the review and evaluation of the Contractor's performance.

f. Helping to resolve Regional priorities, coordinating requests for contractor assistance, managing Regional budgets in liason with the CPM, the WMB Chief, and Headquarters; implementing the CUP.

g. Tracking all WAs, projects, and milestones on Projtrak. All correspondence to the contractor must go through the RPO, including all project plan approvals, modifications, changes in work scope, changes in budget, and changes in schedule.

3. Task Manager (TM)

The TM is the Region V staff person (identified in the "Requestor" signature block on the Project Plan) responsible for the day-to-day management of the project/WA. The TM usually has a counterpart at the State, to jointly monitor the progress of the WA/project. The TM is responsible for evaluating the performance of the contractor on specific WAs/Projects.

The TM is responsible for:

a. Writing project requests.

b. Reviewing project plans for consistency with EPA priorities and the contract service requested.

c. Reviewing all deliverables.

d. Communicating with the contractor, and acting as the liason between the contractor and the State. Communication is accomplished through site visits, telephone contacts, reviewing and commenting on milestones, progress reports, specific outputs, and evaluating contractor performance.

e. Writing and distributing copies of telephone memos, trip reports, status reports and comments on specific deliverables to the RPO, immediate supervisor, and appropriate WMB personnel.

f. Working closely with TL to ensure good project coordination, consistency, and timeliness.

g. Assuring that quality service is provided to the client.

4. Contractor

The term "Contractor" as used throughout this Contract User's Guide means A.T. Kearney, TES IV, and their responsible representatives who direct and perform the various services being provided under this contract.

5. Contracting Officer (CO)

HQ contact who approves and issues WA's. The CO is the only Government employee who can commit the Government's money. Neither the RPO nor the TM can commit the Government to pay for anything. The WA is not official until the CO signs it. The HQ's CO for A.T. Kearney is _____. The CO for TES IV is _____.

6. Technical Liason (TL)

Lisa Pierard is the TL for both contracts. Her responsibilities include:

APPENDIX B

Bias

Bias is a measure of how close the result is to the true value. Bias is assessed by percent recovery and reference samples. The QA accuracy objectives for quantitative analysis are expressed in terms of recovery of surrogate compounds (organic analysis) or recovery of spiked analytes (inorganic analysis).

Recovery of a surrogate compound added to a sample will be defined as follows:

$$\text{Recovery, \%} = \frac{\text{Grams of Surrogate Found in Sample} \times 100\%}{\text{Grams of Surrogate Added to Sample}}$$

The recovery of a spiked analyte is defined as follows:

$$\text{Recovery, \%} = \frac{\text{Total Analyte Found - Analyte Originally Present} \times 100\%}{\text{Analyte Added}}$$

It should be noted that the materials used for spiking must be verified by the use of reference materials. The spike or surrogate is added before digestion.

Precision

Precision is a measure of the reproducibility of a result. Precision is assessed by replicate (duplicate) analysis. If two analytical methods are used to obtain the reported values for the same element for a batch of samples, duplicate samples must be run by each method used. The relative percent difference (RPD) for each component is calculated as follows:

$$RPD = \frac{|D1 - D2| \times 100}{(D1 + D2)/2}$$

Where RPD = Relative Percent Difference
D1 = First Sample Value
D2 = Second Sample Value (duplicate)

Split sample (laboratory replicates) will give a measure of analytical precision. Field replicates will indicate sample homogeneity.

Completeness

Completeness is defined as the degree to which the number of activities initiated are actually finished. Laboratory completeness is addressed in the CLP SOW. Completeness of each RFA sampling study will be addressed in the site specific sampling plan.

Definitions

Replicates - Samples expected to be the same

a) Field Replicates - Samples taken at the same place and time. A measure of sample homogeneity.

b) Split sample or laboratory replicate - Separate aliquots of the same sample. A measure of laboratory precision.

Blank - Distilled water or solvent treated as if it were a sample.

Blanks are used as a baseline and will show contamination from glassware, reagants solvents, atmosphere or unidentified sources.

a) Trip blank - A sample bottle containing organic free water, prepared at the same location and time as the of bottles which are to be used for sampling. It remains with the sample bottles while in transit to the site, during sampling and during the return trip to the lab.

b) Equipment blank - Organic free water placed in contact with the sample collecting equipment and then into a clean sample bottle in the field at the same time that samples are collected.

c) Laboratory or method blank - Distilled water or solvent carried through entire laboratory preparation and analytical procedure.

d) Calibration blank - Distilled water or solvent used as a baseline in calibrating instrument.

Standards - Very pure compounds used to establish instrument response.

a) Calibration standards - Solutions of a pure compound prepared in different concentrations. The calibration standards in combination with the blank are used to draw a calibration curve showing concentration v.s. instrument response.

b) Check standard - solution of pure compound obtained from a different source than the calibration standards. Used to verify continuing calibration of instrument. This may be a standard added to a blank or added to a split sample after preparation.

c) Internal standard - a solution of a pure compound which is different from the analyte(s) of concern. This gives a measure of instrument response.

Spike - A known amount of a analyte added to a (split) sample before sample preparation as a measure of extraction recovery for that compound.

Surrogate - A compound of similar but different chemical structure which is used in the same manner as a spike. Surrogate recoveries are assumed to be spike recoveries although there is controversy on this issue.

Usually only a few surrogates are used to infer the recoveries of several analytes.

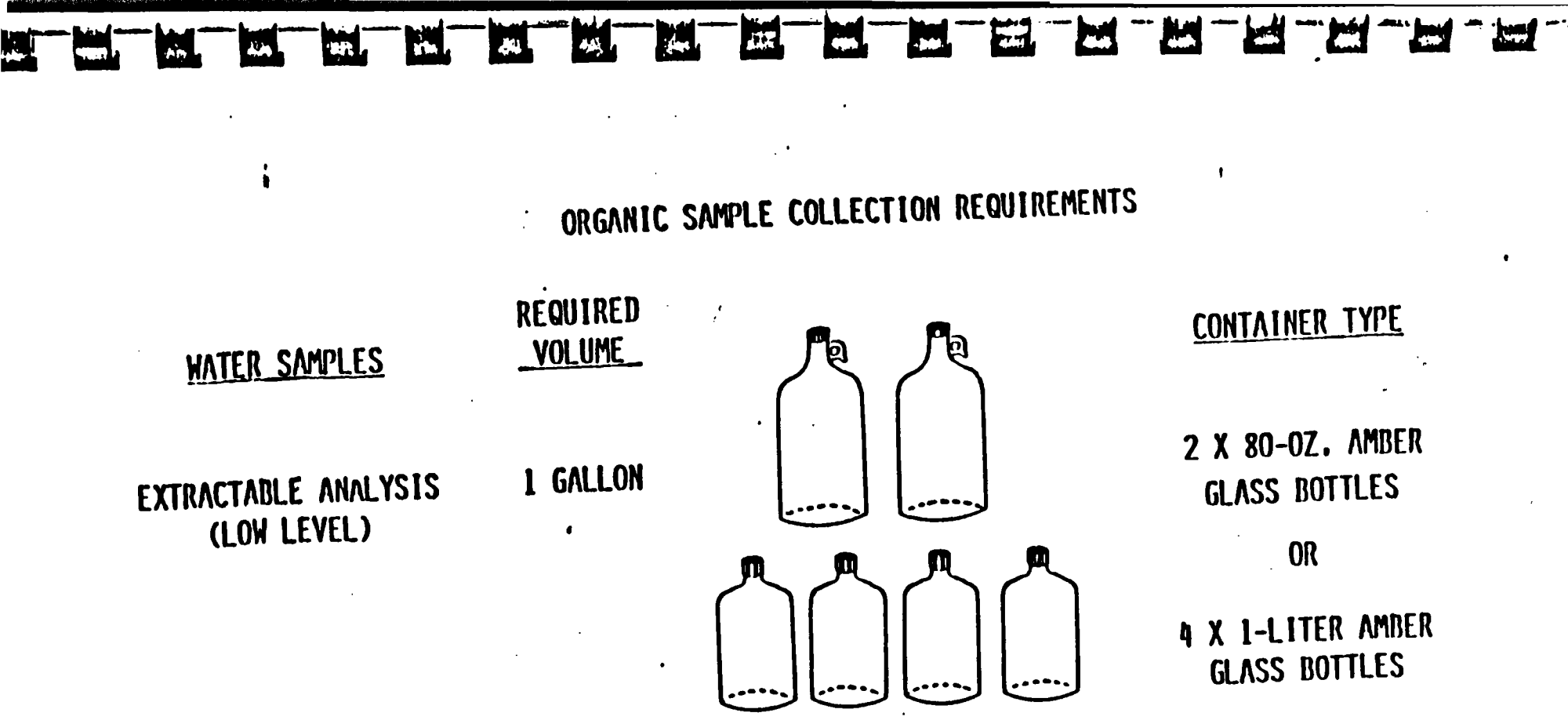
APPENDIX C

SAMPLE QUANTITIES, BOTTLES, PRESERVATIVES AND PACKAGING FOR SEDIMENT AND WATER SAMPLES

Analysis	Bottles and Jars	Preservation	Holding Time	Volume of Sample	Shipping	Normal Packaging
LIQUIDS						
Low Concentration (Organics)						
Acid extractables, base/neutral extractables, pesticides/PCB's	Two 1/2-gallon glass amber bottles (teflon-lined caps)	Iced to 4°C	5 days until extraction	Fill bottle to neck	Priority 1	No. 1 foam liner or vermiculite
Volatiles	Two 40-ml volatile organic analysis (VOA) vials	Iced to 4°C	7 days	Fill completely no air bubbles	Priority 1	No. 1 foam liner or vermiculite
Low Concentration (Inorganics)						
Metals	One 1-liter high density polyethylene bottle	Filtered through 0.45 um filter (groundwater only) HNO_3 to pH <2, Iced to 4°C	6 months	Fill to shoulder of bottle	Priority 1	No. 2 foam liner or vermiculite
Cyanide	One 1-liter polyethylene bottle	NaOH to pH >12, Iced to 4°C	14 days	Fill to shoulder of bottle	Priority 1	No. 2 foam liner or vermiculite
BOD_5	One 1-liter polyethylene bottle	Cool to 4°C	48 hours	Fill to shoulder	Priority 1	No. 2 foam liner or vermiculite
COD	One 1-liter polyethylene bottle	H_2SO_4 to pH <2 Cool to 4°C	28 days	Fill to shoulder	Priority 1	No. 2 foam liner or vermiculite
SOLIDS						
Low Concentration (Organics)						
Acid extractables, base/neutral extractables, pesticides/PCB's	One 8-oz wide mouth glass jar	Iced to 4°C	Not established	Fill 3/4 full	Priority 1	Foam liner No. 3
Volatiles	Two 120-ml VOA vials	Iced to 4°C	Not established	Fill completely no headspace	Priority 1	Foam liner No. 3
Low Concentration (Inorganics)						
All	One 8-oz wide mouth glass jar	Iced to 4°C	Not established	Fill 3/4 full	Priority 2	Foam liner No. 3

ORGANIC SAMPLE COLLECTION REQUIREMENTS

WATER SAMPLES	REQUIRED VOLUME	CONTAINER TYPE
EXTRACTABLE ANALYSIS (LOW LEVEL)	1 GALLON	2 X 80-OZ. AMBER GLASS BOTTLES OR 4 X 1-LITER AMBER GLASS BOTTLES
EXTRACTABLE ANALYSIS (MEDIUM LEVEL*)	1 GALLON	4 X 32-OZ. WIDE-MOUTH GLASS JARS
VOLATILE ANALYSIS (LOW OR MEDIUM LEVEL*)	80 ML	2 X 40-ML GLASS VIALS

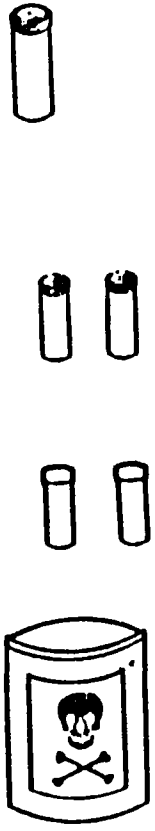


*ALL MEDIUM LEVEL SAMPLES TO BE SEALED IN METAL PAINT CAN FOR SHIPMENT

Rev: 10/84

ORGANIC SAMPLE COLLECTION REQUIREMENTS

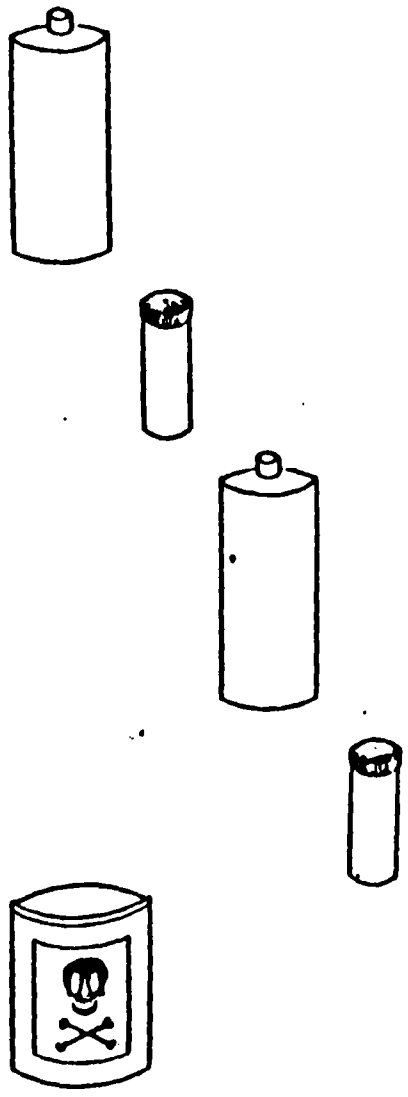
SOIL/SEDIMENT SAMPLES	REQUIRED VOLUME	CONTAINER TYPE
EXTRACTABLE ANALYSIS (LOW OR MEDIUM LEVEL*)	6 OZ.	1 X 8-OZ. WIDE-MOUTH GLASS JAR
		OR
		2 X 4-OZ. WIDE-MOUTH GLASS JARS
VOLATILE ANALYSIS (LOW OR MEDIUM LEVEL*)	240 ML	2 X 120-ML WIDE-MOUTH GLASS VIALS



*ALL MEDIUM LEVEL SAMPLES TO BE SEALED IN METAL PAINT CAN FOR SHIPMENT

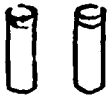
INORGANIC SAMPLE COLLECTION REQUIREMENTS

WATER SAMPLES	REQUIRED VOLUME	CONTAINER TYPE
METALS ANALYSIS (LOW LEVEL)	1 LITER	1 X 1-LITER POLYETHYLENE BOTTLE
METALS ANALYSIS (MEDIUM LEVEL*)	16 OZ.	1 X 16-OZ. WIDE-MOUTH GLASS JAR
CYANIDE (CN^-) ANALYSIS (LOW LEVEL)	1 LITER	1 X 1-LITER POLYETHYLENE BOTTLE
CYANIDE (CN^-) ANALYSIS (MEDIUM LEVEL*)	16 OZ.	1 X 16-OZ. WIDE-MOUTH GLASS JAR



*ALL MEDIUM LEVEL SAMPLES TO BE SEALED IN METAL PAINT CAN FOR SHIPMENT

INORGANIC SAMPLE COLLECTION REQUIREMENTS

SOIL/SEDIMENT SAMPLES	REQUIRED VOLUME		CONTAINER TYPE
METALS AND CYANIDE (CN^-) ANALYSIS (LOW OR MEDIUM LEVEL*)	6 OZ.		1 X 8-OZ. WIDE-MOUTH GLASS JAR
			OR
			2 X 4-OZ. WIDE-MOUTH GLASS JARS

*ALL MEDIUM LEVEL SAMPLES TO BE SEALED IN METAL PAINT CAN FOR SHIPMENT

HIGH HAZARD SAMPLE COLLECTION REQUIREMENTS

	REQUIRED VOLUME		CONTAINER TYPE
LIQUID SAMPLES			
ORGANIC AND INORGANIC ANALYSIS	6 OZ.		1 X 8-OZ. WIDE-MOUTH GLASS JAR
SOLID SAMPLES			
ORGANIC AND INORGANIC ANALYSIS	6 OZ.		1 X 8-OZ. WIDE-MOUTH GLASS JAR

*ALL MEDIUM LEVEL SAMPLES TO BE SEALED IN METAL PAINT CAN FOR SHIPMENT

DIOXIN SAMPLE COLLECTION REQUIREMENTS

SOIL/SEDIMENT SAMPLES	REQUIRED VOLUME		CONTAINER TYPE
2,3,7,8-TCDD (DIOXIN) ANALYSIS	4 OZ.		1 X 4-OZ. WIDE-MOUTH GLASS JAR
			OR
			1 X 8-OZ. WIDE-MOUTH GLASS JAR

*ALL MEDIUM LEVEL SAMPLES TO BE SEALED IN METAL PAINT CAN FOR SHIPMENT

Notes

1. Sample preservation should be performed immediately upon sample collection. For composite samples each aliquot should be preserved at the time of collection. When use of an automated sampler makes it impossible to preserve each aliquot, then samples may be preserved by maintaining at 4°C (±5°C) util compositing the sample splitting is completed.

2. When any sample is to be shipped by common carrier or sent through the United States mails, it must comply with the Department of Transportation Hazardous materials Regulations 949 CFR part 172). The person offering such material for transportation is responsible for ensuring such compliance. For the preservation requirements of Table II, the Office of Hazardous Materials, Materials Transportation Bureau, Department of Transportation has determined that the Hazardous Materials Regulations do not apply to the following materials: Hydrochloric acid (HCL) in water solutions at concentrations of 0.04% by weight or less (pH about 1.96 or greater); Nitric acid (HNO_3) in water solutions at concentration of 0.15% by weight or less (pH about 1.62 or greater); Sulfuric acid (H_2SO_4) in water solutions at concentrations of 0.35% by weight or less (pH about 1.15 or greater; and Sodium hydroxide (NaOH) in water solution at concentration of 0.080% by weight or less (pH about 12.30 or less).

3. Samples should be analyzed as soon as possible after collection. The times listed are the maximum times that samples may be held before analysis and still considered valid.

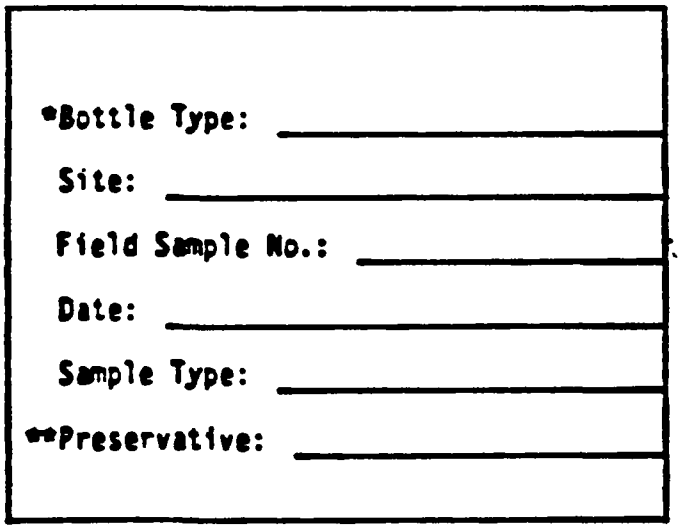
4. For cyanide, total and amenable to chlorination, preserve with 0.6g ascorbic acid only if residual chlorine is present.

   Maximum recommended holding time for cyanide is less when sulfide is present. Optionally, all samples may be tested with lead acetate paper before the pH adjustment in order to determine if sulfide is present. if sulfide is present, it can be removed by the addition of cadmium nitrate powder until a negative spot test is obtained. The sample is filtered and then NaOH is added to pH 12.

5. Samples for metals should be filtered immediately on-site before adding preservative for dissolved metals.

APPENDIX D

SAMPLE LABEL



*This space will be used to reflect bottle use such as metals, organics, etc. The title "Bottle Type" will not be shown on the label.

**This space will be used to indicate how the sample is to be preserved. The title "Preservative" will not be on the label.

FIELD LOG SHEET

Facility Name: _____

Facility Address: _____

Location and Description of Sampling Point: _____

_____

Field Sample Number: _____

Purpose of Sampling: _____

Type of Waste: _____

_____

Process (if known) Producing Waste: _____

_____

Suspected Composition, Including Concentrations (if known): _____

_____

Sampling Methodology: _____

_____

_____

Date and Time of Collection: _____

Results of any Field Measurements Made: _____

_____

Observations and Comments: _____

_____

_____

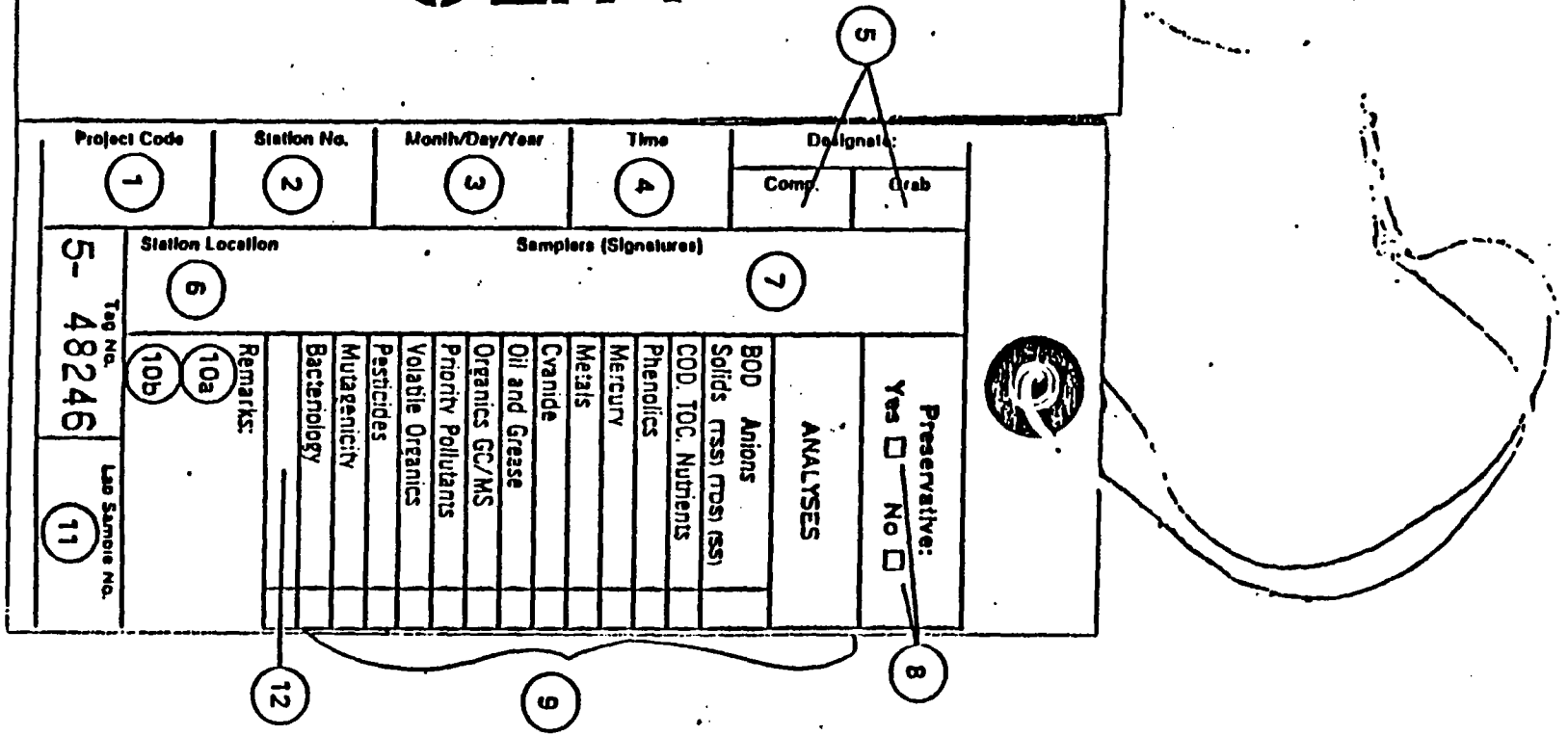
NAME (Printed): _____

Signature: _____

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5
230 South Dearborn Street
Chicago, Illinois 60604

EPA



SAMPLE TAG

1. Enter the first six digits of the CRL sample identification.
2. Enter the last three digits of the CRL identification code.
3. Enter date of sampling.
4. Enter time of sampling (military time only).
5. Specify "grab" or "composite" sample with an "X".
6. Insert sample identification code.
7. Obtain signature of sample team leader.
8. Indicate presence of preservative with an "X".
9. Specify parameters for analysis with an "X".

10a. Indicate traffic report type and serial number.

10b. Indicate case number.

11. Leave BLANK (for laboratory use only).
12. Enter any desired analyses not listed on menu provided (e.g., PCB's, ammonia, sulfide, etc.) and mark box with an "X".

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

REGION 6
230 South Dearborn Street
Chicago, Illinois 60604

CHAIN OF CUSTODY RECORD

PROJ. NO. (1)	PROJECT NAME (2)					NO. OF CONTAINERS	(10)	(15) REMARKS
SAMPLERS: (Signature) (3)								
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION			
(4)	(5)	(6)	(7)		(8)	(9)	(11)	(12)

Relinquished by: (Signature) (13)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks (14)	

Distribution White — Accompanies Shipment; Pink — Coordinator Field Files; Yellow — Laboratory File

FIGURE 15
Page 1 of 2

CHAIN-OF-CUSTODY FORM

1. Enter first six digits of the CRL sample identification code.
2. Enter site name and project number.
3. Obtain full signature of sample team leader and signed initials of active team members (including paperwork person).
4. Enter last three digits of the CRL sample identification code (eg. S01, D02, R01, etc.)
5. List sampling dates for all samples.
6. List sampling times for all samples.
7. Indicate "grab" or "composite" sample with an "X."
8. List sample numbers.
9. Enter number of containers per sample and container volume (e.g., 2-40 ml).
10. List analyses individually.
11. Construct column heading for traffic report number and list serial numbers for corresponding sample identification codes.
12. Construct column heading for "tag number" and list tag numbers for each sample container.
13. Obtain signature of sample team leader and carry out chain of custody procedures.
14. State carrier service and air bill number, lab service, and custody seal numbers.
15. Write in the words "CASE #:" and enter the case number.

CENTRAL REGIONAL LABORATORY SAMPLE DATA REPORT
ORGANICS/INORGANICS
THIS FORM IS TO BE USED FOR SAMPLES SENT TO CONTRACT ONLY

CASE NUMBER (1) SITE NAME (2) LABORATORY (3) DATE SHIPPED (4)

SUPERFUND DU NUMBER (5) EPA RPM or OSC (S.M.S.)/(CES) (6) PAGE (7) OF ____

ACTIVITY NUMBER (8)

			SOIL (12)													WATER											
CRL LOG NUMBER	ORGANIC TRAFFIC REPORT NUMBER	INORGANIC TRAFFIC REPORT NUMBER	ACID-BASE NEUTRAL CPDS ORGANIC SCAN MG KG TOX 2571	VOLATILE ORGANIC ANALYSIS ORGANIC SCAN MG. KG TOX 2641	POLY CHLORINATED BIPHENYLS MG/KG PES 2441	CHLORINATED PESTICIDES MG/KG PES	ICP METALS UG/G MET 2596	PB UG/G MET 2346	BA UG/G MET 231							ACID-BASE NEUTRAL CPDS ORGANIC SCAN TOX 3573	VOLATILE ORGANIC ANALYSIS ORGANIC SCAN TOX 3563	POLYCHLORINATED BIPHENYLS PES 3143	CHLORINATED PESTICIDES PES 3133	TOTAL METALS UG M³	TSP UG M³	PB	SB				
(9)	(10)	(11)																									

CENTRAL REGIONAL LABORATORY SAMPLE DATA REPORT

1. Insert assigned laboratory case number.
2. Insert site name.
3. Insert laboratory names, indicating which lab will receive the organic samples and which lab will receive the inorganic samples.
4. Insert date of shipment.
5. Insert DU number.
6. Insert name of RPM or OSC.
7. Insert page number and total number of pages.
8. Insert activity number.
9. Insert CRL log number, which consists of the fiscal year, contractor code, sampler code, round of sampling, sample type designation and sample number.
   eg. 8 7 S W 0 1 S 0 1
   (a) (b) (c) (d) (e) (f)

a.	b.	c.	d.	e.	f.
FY	contractor code	this could be the 1st letter of surname of the sampler	round	sample type, could be: S-sample D-duplicate R-field blank	sample number ie. 01,02,etc.

10. Insert organic traffic report number.
11. Insert inorganic traffic report number.
12. Indicate the analyses required (eg. acid-base neutral cpds, volatile organic analysis, etc.) for each sample in the appropriate section (for waters or soils) with an "X".

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ORGANICS TRAFFIC REPORT

Sample Number: S 4601

① Case Number: (1)

Sample Site Name/Code: (2a) (2b)

② SAMPLE CONCENTRATION (Check One) (13)
___ Low Concentration
___ Medium Concentration

③ SAMPLE MATRIX (Check One) (14)
___ Water
___ Soil/Sediment

④ Ship To: (17)

Attn: (18)

Transfer Ship To: (19)

⑤ Regional Office: (3)

Sampling Personnel: (4)

(Name) (5)

(Phone)

Sampling Date: (6)

(Begin) (End)

⑥ For each sample collected specify nu of containers used and mark volume l on each bottle.

	Number of Containers	Appro Total V
Water (Extractable)		
Water (VOA)		
Soil/Sediment	(15)	
Water (Ext/VOA)		(16)
Other		

⑦ Shipping Information (7)

Name of Carrier (8)

Date Shipped: (9)

Airbill Number:

s 4601	- Water (Extractable)
s 4601	- Water (Extractable)
s 4601	- Water (Extractable)
s 4601	- Water (Extractable)
s 4601	- Water (VOA)
s 4601	- Water (VOA)
s 4601	- Soil/Sediment (Ext & VOA)
s 4601	- Soil/Sediment (Ext & VOA)
s 4601	- Water (Ext & VOA)
s 4601	- Water (Ext & VOA)

⑧ Sample Description (10)

___ Surface Water ___ Mixed Media
___ Ground Water ___ Solids
___ Leachate ___ Other (specify) _____

⑨ San (20)

⑩ Special Handling Instructions:
(e.g., safety precautions, hazardous nature)

(11)

(12)

SMO COPY

ORGANIC TRAFFIC REPORT

1. Insert assigned laboratory case number.
2a. Insert CRL sample identification number.
2b. Insert sample number.
3. Insert EPA region number (e.g., V).
4. Insert sample team leader's name.
5. Insert sample team leader's office telephone number (do not use field office telephone number).
6. Insert date sample was taken.
7. Indicate "Federal Express" (or other approved carrier).
8. Indicate date of shipment.
9. Indicate air bill number.
10. Specify sample description with an "X".
11. Insert the phrase "QC lot number:" and indicate the quality control lot number(s) of the container(s).
12. Insert the phrase "matches ITR number:" and indicate the corresponding inorganics traffic report for the sample (if any).
13. Specify the sample concentration with an "X".
14. Indicate the sample matrix with an "X".
15. Insert an estimated sample volume in appropriate box.
16. Insert laboratory name and address.
17. Indicate name of laboratory contact.
18. Leave BLANK
19. Leave BLANK (or make reference notes for future use)

8-83

U.S. ENVIRONMENTAL PROTECTION AGENCY (HW) Sample Management Office
P.O. Box 818, Alexandria, VA 22313 (703/557-2490 FTS/8-557-2490)

INORGANICS TRAFFIC REPORT

Sample Number
MS 1535

(1) Case Number: (1)
Sample Site Name/Code:
(2a)
(2b)

(2) SAMPLE CONCENTRATION (Check One) (9)
___ Low Concentration
___ Medium Concentration

(3) SAMPLE MATRIX (Check One)
___ Water
___ Soil/Sediment (10)

(4) Ship To: (16)

Attn: (17)

Traelor Ship To: (18)

(5) Sampling Office: (3)

Sampling Personnel:
(Name) (4)
(Phone) (5)
Sampling Date: (6)
(Begin) _____ (End) _____

(6) Shipping Information:
Name Of Carrier: (11)
Date Shipped: (12)
Airbill Number: (13)

(7) Sample Description: (Check One)
___ Surface Water
___ Ground Water
___ Leachate (7)
___ Mixed Media
___ Solids
___ Other _____ (specify)
MATCHES ORGANIC SAMPLE NO. (8)

(8) Mark Volume Level On Sample Bottle
Check Analysis required
___ Task 1 & 2
___ Task 3 Ammonia
Sulfide
Cyanide (14)
(15)

SMO COPY

MS 1535 - Task 1 & 2
MS 1535 - Task 1 & 2
MS 1535 - Task 3
MS 1535 - Task 3
MS 1535 - Task 3
MS 1535 - Task 3

INORGANIC TRAFFIC REPORT

1. Insert assigned laboratory case number.
2. Insert sample number.
3. Insert EPA region number (e.g., V).
4. Insert sample team leader's name.
5. Insert sample team leader's office telephone number (do not use field office telephone number).
6. Insert date sample was taken.
7. Indicate sample description with an "X".
8. Insert corresponding organic traffic report number for the sample (if any).
9. Specify sample concentration with an "X".
10. Indicate sample matrix with an "X".
11. Insert "Federal Express" (or other approved carrier).
12. Indicate date of shipment.
13. Indicate air bill number on which shipment was made.
14. Check required analyses: Tasks 1 and 2 (metals) and/or Task 3 (cyanide only, ammonia and sulfide are no longer RAS, although some older traffic reports may still list them.
15. Insert the phrase "QC lot number:" and indicate the quality control lot number(s) of the container(s).
16. Insert laboratory name and address.
17. Indicate name of laboratory contact.
18. Leave BLANK - for laboratory use only.

U.S. ENVIRONMENTAL PROTECTION AGENCY — Sample Management Office

HIGH HAZARD TRAFFIC REPORT

Sample Number S 5429

FIELD SAMPLE RECORD

(1) Case Number: (1)

Sample Site Name/Code:
(2a)
(2b)

(2) Field Sample Description:
__ Drum
__ Aqueous Liquid
__ Sludge
__ Solid (11)
__ Oil
__ Other

(3) Ship To: (16)

Attn: (17)

(4) Sampling Office: (3)

Sampling Personnel: (4)
(name) (5)
(phone)

Sampling Date: (6)
(begin) (end)

(5) Known or Suspected Hazards: (12)

(6) Sample Location: (18)

(7) Preparations Requested:
(check below)
Sample Volume: (13)
__ Organics
__ Volatile Organics
__ Base/Neutral, Acid, TCDD (14)
__ Pesticides, PCB

__ Inorganics
__ Total Metals
__ Total Mercury (15)
__ Strong Acid Anions

(8) Shipping Information: (7)
(name of carrier)
(8)
(date shipped)
(9)
(airbill number)

S 5429
S 5429
S 5429
S 5429
S 5429

(9) Special Handling Instructions:

(10)

SMO Copy

High Hazard Traffic Report

1. Insert assigned laboratory case number

2a. Insert CRL sample identification code

2b. Insert sample identification code

3. Insert EPA region number (e.g. V)

4. Insert sample team leader's name

5. Insert sample team leader's office telephone number (do not use field office telephone number)

6. Insert date sample was taken

7. Insert "Federal Express" (or other approved carrier)

8. Indicate date of shipment

9. Indicate air bill number on which shipment was made

10. Insert the phrase "QC lot number: " and indicate the quality control lot number(s) of the container(s)

11. Indicate sample description with an "X"

12. List known or suspected hazards

13. Indicate volume of sample

14. Specify desired organic parameters to be analyzed for

15. Specify desired inorganic parameters to be analyzed for (strong acid anions include Cl^-, $SO_4^=$, NO_3^-, F^-)

16. Insert lab name and address

17. Insert name of laboratory contact

18. Leave BLANK (or make reference notes for future use)

SAS PACKING LIST

1. Insert assigned SAS case number.
2. Insert EPA region number (e.g., V).
3. Insert sample team leader's name.
4. Insert sample team leader's office telephone number (do not use field office telephone number).
5. Insert date sample was taken.
6. Indicate date of shipment.
7. Insert site name.
8. Insert laboratory name and address.
9. Indicate name of laboratory contact.
10. List SAS sample numbers, which should include the SAS number.
11. Specify sample matrix, concentration, tag number, and analysis to be performed (e.g., low concentration soil sample for PCB analysis, tag number 5-48246).
12. Leave BLANK - for laboratory use only.

U.S. ENVIRONMENTAL PROTECTION AGENCY
CLP Sample Management Office
P.O. Box 818 - Alexandria, Virginia 22313
Phone: 703/557-2490 - FTS/557-2490

(1) SAS Number:

SPECIAL ANALYTICAL SERVICE
PACKING LIST

Sampling Office: (2)	Sampling Date(s): (5)	Ship To: (8)	For Lab Use Only
Sampling Contact: (3) (name)	Date Shipped: (6)		Date Samples Rec'd:
(4) (phone)	Site Name/Code: (7)	Attn: (9)	Received By:

	Sample Numbers (10)	Sample Description i.e., Analysis, Matrix, Concentration (11)	Sample Condition on Receipt at Lab (12)
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			

For Lab Use Only

White - SMO Copy, Yellow - Region Copy, Pink - Lab Copy for return to SMO, Gold - Lab Copy

RCRA FACILITY INVESTIGATION
QUALITY ASSURANCE PROJECT PLAN REVIEW

REFINED METALS CORPORATION
BEECH GROVE, INDIANA
EPA ID No. 000718130

The Quality Assurance Project Plan (QAPP) for the RCRA Facility Investigation (RFI) at the Refined Metals Corporation(RMC) facility in Beech Grove, Indiana, is presented in Appendix B of the August 1998, RFI Work Plan. General and specific deficiencies in the QAPP are discussed in the comments which follow.

GENERAL COMMENTS

1. **QAPP Content**: The information provided in the QAPP does not meet the requirements of the April 1998 U.S. EPA Region 5 RCRA QAPP Instructions(Instructions). Sections are missing or incomplete. The following are examples of the deficiencies:

   - There is no section on Risk Related Issues.
   - No justification for the shortened analytical parameter list is provided.
   - No justification for the use of filtered metals results is included.
   - There is no indication that U.S. EPA will be notified of all issues which affect project QA/QC objectives as soon as they arise.

   Revise the QAPP as necessary to meet the content requirements of the Instructions. In addition, once these revisions have been completed, review the QAPP, RFI Work Plan and any other associated documents to ensure that all references to sections in the QAPP have also been revised as necessary.

2. **Project Objectives**: The QAPP does not include a thorough discussion of the project objectives or the intended data usages. Revise the QAPP, as required by the Instructions, to include a statement of the overall project objectives and project-specific data objectives. Additionally, an outline of the specific usages of all laboratory and field data must be provided.

Revise the project description to clearly and thoroughly discuss the realistic objectives of the proposed activities, providing quantitative criteria for each decision to be made in association with the investigation. For example, if determination of nature and extent of contamination is an objective, indicate the actual results which will be considered indicative of the presence of contamination. In addition, ensure that the actual laboratory detection limits are sufficiently low to support all associated decision criteria.

3. **Project Objectives**: It is unclear whether the information gathered from the data collection activities are to be used to assess human health and ecological risks. Section 3.9 of the QAPP indicates that the data collected may be used for a "baseline human health risk assessment" and "preliminary ecological risk assessment". However, the decision statement provided in Section 1.1.2 does not specify that a risk assessment will be performed. The decision rule provided in Section 1.1.2 outlines different goals than those specified in Sections 3.8 and 3.9 of the QAPP.

   Revise the QAPP to clarify and include a discussion of risk-related issues within the QAPP. For example, provide a discussion of the ecological data quality levels, human-health risk-related issues, land use planning and assumptions, risk-based screening options, and data quality for assessing human health risk.

4. **Historical Date**: Section 3.8 of the QAPP references "historical data". However, the data are not provided in the QAPP. Revise the QAPP to include the data so that it may be evaluated. If historical data is used, Section 9 of the QAPP must be revised to discuss the data acquisition requirements. In addition, the QAPP must be revised to clearly identify the sources of previously collected data and other information that will used for making decisions in this project.

5. **Analytical Parameters List**: The information provided concerning the unit-specific analytical parameter lists is insufficient. In addition, spiking levels are not included. Finally, no organic analyses are proposed in spite of the fact that a known diesel release has occurred.

Revise the QAPP to provide a thorough justification for the very short parameter list, including why no testing is being proposed for the diesel spill area and why only four metals will be analyzed. Ensure that all information required in the Instructions is included.

6. **Analytical Methodologies**: The information provided concerning the analytical methods is often incorrect. For example, although quality control limits are provided in Table 3.2, these limits are often greater than the method allows.

   Revise the QAPP to provide correct method numbers and QC limits for the proposed analytical methodologies (or a specific reference to where this information can be found in the associated revised Work Plan).

7. **SW-846 Methods**: The QAPP references the November 1986, edition of SW-846. However, this document has been updated by U.S. EPA.

   Revise the QAPP to indicate that the information presented in SW-846, Final Update III, June 1997 will be used. Ensure that all information in the QAPP, including all SOPs provided in Appendix B, are consistent with the information in and requirements of the most recent update of SW-846.

8. **Sampling Rationale:** The QAPP currently references Sections 4.0 and 5.0 of the RFI Work Plan for this information. While referencing the associated work plan for such information is generally acceptable, in this case the RFI Work Plan does not contain sufficient detail to meet the Instruction's requirements.

   Revise the QAPP to provide detailed discussions of each of the following topics, including actual procedures and specific rationales.

   - Rationale for selecting sampling locations and parameters.
   - Procedure to determine background levels of metals.
   - Instructions for collecting QC samples for each matrix and parameter.
   - Pertinent regulatory requirements.

The rationale must include specific references to earlier studies or other sources of information supporting the decision, and be appropriate based on the project objectives for the sampling event.

SPECIFIC COMMENTS

1. **Title/Signature Page:** The title/signature page of the QAPP does not include all the information required by the Instructions. Revise the title/signature page to include the following information:

   - EPA facility identification number.
   - The firm that prepared the plan as well as the organization for whom it was prepared.
   - The name, signature and date space for the U.S.EPA RCRA Enforcement/Permitting QA Coordinator.
   - The QAPP revision number on both pages of the Title/Signature page.

2. **Document Control Format (DCF):** The DCF used in the QAPP does not follow the Instructions. The QAPP submitted includes the date of the document as the revision number. However, it is possible to have multiple revisions within the same month and year. Modify the DCF to include the revision number of the document as well as the date of the revision.

3. **Document Control Format (DCF):** The Table of Contents and the associated sections of the QAPP do not include page numbers for all figures, tables and attachments. Revise the QAPP so that all pages, including tables and figures, are paginated according to the Instructions.

4. **Table of Contents:** The last page of the Table of Contents includes a general listing of the organizations that will receive a copy of the QAPP. However, U.S. EPA has not been included on this list. Revise the Table of Contents to include a complete listing of the names of persons, and organizations, who will receive copies of the QAPP.

5. **Section 1.1.2:** Section 1.1.2 of the QAPP indicates that the objective of the RFI is to determine whether a corrective measures study should be performed. However, the decision statement indicates that "unacceptable risks" are to be

evaluated. Table 1.1 of the QAPP also provides reporting limits for "Human Health Data Quality Level" and "Ecological Data Quality Level". If this is the case, then the project objectives must be modified to include the gathering of data to quantify risks.

Revise the project objectives to clearly identify the purpose of the RFI and ensure that the statements within the QAPP are consistent and support the overall project objectives. See also General Comments 2 and 3 above.

6. **Section 1.2:** The site description and geological setting provided in Section 1.2, is incomplete. Revise the site description (or provide a specific page and section reference to where this information can be found in the associated revised Work Plan) to include the following:

- Receiving watershed and airshed information;
- Topographic information;
- Geological and hydrogeological information;
- Types of hazardous wastes or constituents of concern managed at each unit;
- Previous sampling efforts and historical sampling results; and
- Any other important physical features of the site which may impact the data collection activities.

Ensure that all information required in the Instructions is included.

7. **Section 1.2:** Section 1.2 states that "The Site" is "bordered by industrial and commercial facilities, and vacant lots."

Revise the QAPP to clearly indicate on which side(s) of the site the industrial and commercial facilities are located.

8. **Section 1.3:** Section 1.3 refers to past sampling data. However, the data are not provided. This information is necessary to clearly evaluate whether the suggested sampling parameters and locations are sufficient to characterize the site as well as meet the overall project objectives of the QAPP.

Revise the QAPP to provide a summary of all past sampling data with an overview of the results or copies of previous reports.

9. **Section 1.4:** Section 1.4 states that the sampling locations "are proposed and depending on the nature of encountered field conditions, sampling locations may be changed." However, it is unclear what kind of field conditions would change the sampling locations or how these changes may affect the project objectives.

   Revise the QAPP to ensure that any changes in sampling locations would generate the level of data that is necessary to fulfill project objectives.

10. **Section 1.4:** Section 1.4 states that "The rationale of the selected sampling locations are fully described in Sections 5.2, 5.3, 5.4, and 5.5 of the RFI Work Plan." These sections of the RFI Work Plan indicate where the samples will be taken and briefly outline the sampling procedures. However, the rationale for the sample locations for each matrix has not been provided in sufficient detail.

    Revise the QAPP or RFI Work Plan to provide the rationale for the sampling locations of each matrix and for the number of samples to be taken at each location.

11. **Section 1.5:** Revise the QAPP to provide a detailed description of the project schedule including time frames anticipated for project initiation, and key dates or milestones. It is recommended that this information include a graphical presentation of the schedule.

12. **Table 1.1:** Table 1.1 of the QAPP is incomplete. Summary statistics, e.g., mean maximum, range, etc., which specify the form the data will be in when compared to action levels or standards expressed in decision rules are not included. Also, the table does not include the acceptable level of confidence needed in the data, or the acceptable amount of uncertainty.

    Revise the table to include the necessary summary statistics, or provide a reference as to where the information can be found.

13. **Section 2.1.2:** The discussion of the duties of the RMC Project Manager is vague and lacking necessary detail. According to the Instructions, the QAPP must clearly outline "all project activities, technical and administrative matters" that the Project Manager will perform.

    Revise Section 2.1.2 to provide a complete description of the RMC Project Manager's duties.

14. **Section 2.2:** The Quality Assurance responsibilities listed in Section 2.2 do not include system or performance audits.

    Revise Section 2.2 to indicate that the QA Manager will perform a system audit as well as a performance audit.

15. **Figure 2-1:** Figure 2-1 indicates that the Region 5 Remedial Project Manager reports to the RMC Project Manager. However, the U.S. EPA Region 5 Remedial Project Manager has overall responsibility for all phases of the investigations.

    Revise the QAPP to ensure that the RMC Project Manager will report directly to the U.S. EPA Region 5 Remedial Project Manager. Revise Figure 2-1 to reflect this modification in the lines of authority.

16. **Figure 2-1:** The following discrepancies were noted in Figure 2-1:

    - Section 2.2 identifies QA Scientists who will report to the QA Manager. However, the QA Scientists have not been identified on Figure 2-1.
    - Section 2.3 identifies Gary Wood as the Laboratory Program Manager for the project. However, Gary Wood has not been included in Figure 2-1.
    - Figure 2-1 identifies Rick D. Wilson as the Laboratory QA Supervisor. The text on page 2-5 identifies Rick D. Wilburn.

    Revise the figure and text to be consistent and ensure that Figure 2-1 includes all persons identified with responsibility for the project.

17. **Section 3.1:** Section 3.1 states that "Precision control can be found on Table 3.2 and also in the applicable SOPs."

    Revise the QAPP to clarify "applicable SOPs" and provide exact references as to where the precision information can be found. Indicate at what rate field and laboratory

duplicates will be collected, and the total number of duplicates to be collected for the sampling event. Referencing other sections of the QAPP where this information can be found is acceptable.

18. **Section 3.2:** Section 3.2 states that "accuracy is calculated using the equation presented in Section 12.2 of this QAPP." One of the equations presented in Section 12.2 is incorrect.

    The equation should state: SR/TV x 100 not SR/TV = 100. Revise the QAPP to reflect this change.

19. **Section 3.3:** Section 3.3 states that "Comparison of the analytical results from field duplicates will provide a direct measure of individual sample representativeness." However, acceptance goals are not defined.

    Revise the QAPP to provide the acceptance goals in the comparison of the field duplicate results.

20. **Section 3.4:** The QAPP states that "A usability criteria of 90 percent has been set for the project." However, Table 3.1 indicates that the completeness goals for field assessment will be "100%".

    Revise the QAPP to address this discrepancy.

21. **Section 3.5:** The QAPP does not adequately address how data comparability is accomplished. For example, simply stating that "comparability will be controlled through sample collection, methodology, analytical methodology and data reporting" is insufficient.

    Revise the QAPP to clearly state that comparability is accomplished by ensuring that the proper sampling techniques are used and that the sample collection plan is followed.

22. **Section 3.9:** The decision rule that is identified in Section 3.9 is different from the decision rule statement made in Section 1.1.2.

    Revise the QAPP to clarify this and ensure that the information provided in the text is consistent throughout the QAPP. Ensure that the QAPP provides information that is consistent with fulfilling the project objectives.

23. **Section 4.0:** The sampling protocols for the QAPP do not include obtaining QC samples.

Revise the QAPP to include explicit instructions for collecting each applicable type of QC sample for each matrix and associated analytical parameter.

24. **Section 4.0:** Section 4.0 does not provide sample container information for each analytical fraction, matrix and concentration level. The number of containers required for each analysis is also not provided.

Revise the QAPP to provide the number and type of containers required for each analytical fraction, matrix and concentration level.

25. **Section 4.0:** Section 4.0 does not provide detailed information on the labeling and numbering of sample containers. For example, stating that each sample "will be assigned a sample designation according to a pre-determined numbering system" is insufficient.

Revise the QAPP to provide detailed information on the labeling and numbering of all samples collected. Ensure traceability of the samples to the field locations.

26. **Section 4.3.1:** Section 4.3.1 states that dust sampling procedures can be found in the "SOPs provided in Attachment B." However, Attachment B only contains the sampling information for groundwater, soil and sediment samples and decontamination of sampling equipment. Revise the QAPP to provide detailed information for sampling dust, including:

- Detailed "cookbook" procedures to collect investigative samples.
- Procedures for determining "background" concentrations of total metals.
- Listing all necessary equipment for dust sampling.

27. **Section 5.1.2:** The QAPP does not state that laboratory identification numbers will be entered on the sample tags.

Revise the QAPP to include a space for the laboratory sample number (provided by the laboratory upon log-in) on the sample tags.

28. **Section 5.1.4:** This section of the QAPP identifies the sample shipment procedures. The first step in this procedure states, "Check each sample bottle for a properly completed sample identification label." This is the first reference to a "sample identification label" in the QAPP.

Clarify if this is meant to be a "sample tag" rather than a "sample label". If it is a label, indicate what information is provided on a sample label. Also, revise the procedures in this section to include checking the sample bottle for a properly completed sample tag.

29. **Section 5.2:** The section on Laboratory Sample Custody Procedures in incomplete.

Revise Section 5.2 to reference Appendix B, Laboratory Chain-of-Custody Standard Operating Procedure (SOP), and provide the following information:

- Describe the internal sample tracking and numbering systems.
- Specify how and when samples, extracts and digestates are disposed.
- Specify how custody of analytical data is maintained.
- Specify how analytical data and custody records are "purged" from the custody of the laboratory to the final evidence file.

30. **Section 7.1:** The QAPP states that "All field measurements will be collected according to manufacturer's instructions and the SOP's provided in Attachment B." However, Attachment B includes the SOPs for only the pH and conductivity testing. SOPs for temperature, Eh, dissolved oxygen and turbidity measurements are not provided.

Revise the QAPP to include SOPs for temperature, dissolved oxygen, Eh, and turbidity.

31. **Section 7.1:** Turbidity is mentioned in Section 7.1 as well as Table 3.4 of the QAPP, as a field measurement to be obtained during the sampling event. However, no mention of turbidity is made in Tables 3.1, 3.2 or 4.1.

Revise the QAPP to clarify if turbidity analysis will be performed. If turbidity will be measured, include the associated method, holding time, preservation and analysis information.

32. **Section 7.2:** This section of the QAPP references Table 3.3 for the methods to be used for the analytical parameters. The following discrepancies were found between Table 3.3 and the information provided in the Laboratory SOPs:

- For aqueous matrix, Table 3.3 identifies only the laboratory SOP for "GR-01-121", which is the SOP for Method 3010A. However, "GR-01-124" is the SOP for Method 3005A, which should also be listed.
- Table 3.3 identifies SW-846 Method 3050B as the preparation method for soil, sediment and dust matrices. The associated laboratory SOP is listed as "GR-01-103". However, this SOP is based on SW-846 Method 3050A.
- Table 3.3 identifies SW-846 Method 6010B as the anlytical method for dust, soil and sediment matrices. The associated laboratory SOP is listed as "No.GR-01-100". However, this SOP is based on SW-846 Method 6010A.

Revise the QAPP to clarify these method discrepancies and ensure that laboratory SOPs are based on the most recent June 1997 update of SW-846.

33. **Section 7.2:** The QAPP does not provide a procedure for the filtration of dissolved metals samples. If filtered groundwater samples are to be analyzed for metals, the QAPP must be revised to provide the filtering procedure.

34. **Section 8.2:** The QAPP does not adequately reference the location of laboratory QC information. For example, throughout the discussion of the laboratory internal QC checks, the QAPP only indicates that the information is in the "laboratory SOPs found in Appendix B".

Revise the QAPP to provide specific references to each laboratory SOP section where the specific QC requirements are described.

35. **Section 9.2.2:** According to the QAPP, data validation is to be performed by the "AGC Quality Assurance Manager or Quality Assurance Scientist".

Revise the QAPP to clarify the validation will be performed by a party independent of both the field sampling team and the laboratory generating the data.

36. **Section 9.2.2:** This section of the QAPP references the U.S. EPA Contract Laboratory Program (CLP) Functional Guidelines for Inorganic Data Review (Functional Guidelines). However, the Functional Guidelines are only directly applicable to the CLP Statement of Work (SOW).

For SW-846 and other analytical methods, this guidance document can be used to construct the validation procedures. Therefore, revise the QAPP to include specific validation procedures and QC limits for all project parameters.

37. **Section 9.2.2:** Stating that the samples will "be flagged as described in the referenced validation guidelines" is insufficient.

Revise the QAPP to specify and define all qualifiers which may be used in the validation report.

48. **Section 9.3:** The QAPP states that data validation reports will be "submitted periodically to the RMC Project Manager".

Revise the QAPP to define "periodically" and clearly specify how often the reports will be submitted.

39. **Section 9.4.2:** The QAPP states that "CLP-like deliverables" are required. However, CLP-SOW deliverables are only directly applicable to CLP-SOW analyses. Since the samples are to be analyzed by SW-846 method, a listing, or example of a data deliverable package is required to be submitted in

the QAPP. In addition to the information listed on page 9-4, ensure that the following is also included;

- Copies of sample and standard preparation logs;
- Calibration (initial/continuing) summary and raw data;
- Interlement correction data;
- Linear range data;
- Method and instrumental detection limit results;
- Copies of internal and field COCs, and cooler receipt forms.

40. **Section 10.1:** The discussion of the laboratory performance and system audits is very general. Revise the discussion of laboratory performance audits to include the following:

- Staff responsible for performing the performance and system audits. Ensure that the staff identified is consistent with the information provided in Section 2 and Figure 2-1 of the QAPP.
- Internal and external performance and system audits to be performed by/for the laboratory.
- The frequency of all audits.
- The audit procedures as well as the documentation procedures of the audit.
- Provide the results of the audit performed by the U.S. EPA in 1994.

41. **Section 10.2:** The discussion on field audits is insufficient. Revise the QAPP to include the following information:

- Internal and external performance and system audits to be performed for the sampling event.
- Staff responsible for performing the audits .
- Frequency of the audits.

42. **Section 11.0:** The QAPP does not describe the procedures for inspecting and accepting consumable supplies.

Revise the QAPP to include a discussion on the system for inspecting and accepting all supplies and consumables that may directly or indirectly affect the quality of the sampling event. For each item identified, provide the inspection or acceptance testing requirements and specifications, as well as any requirements for certificates of purity or analysis.

43. **Section 13.2:** The procedure for documenting laboratory corrective action is unclear.

Revise the QAPP to ensure that all laboratory corrective action procedures are properly documented in the monthly reports and that any corrective action issue which directly impacts project quality objectives is reported immediately to the U.S. EPA Remedial Project Manager.

44. **Section 14.2:** The QAPP states that sample anlaysis results reports will be submitted to the RMC Project Manager "as they become available."

Revise the QAPP to define a specific turn around time for the analytical data and clearly specify how often the reports will be submitted.

45. **Appendix B:** Section 2.3 of Procedure No.6 of Appendix B states that "Proper disposal of the waste will be arranged by Gould's representatives."

Clarify who "Gould" is, and if it is another subcontractor involved in the sampling event. If so, revise Section 2 of the QAPP to include the key personnel of the organization.